STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DG 17-048

IN THE MATTER OF: LIBERTY UTILITIES(EnergyNorth Natural Gas
Company Inc) CORP. d/b/a LIBERTY UTILITIES

DIRECT TESTIMONY

OF

J. RANDALL WOOLRIDGE
CONSULTANT TO STAFF

November 30, 2017

EnergyNorth Natural Gas Company
Docket No. DG 17-048

Direct Testimony of
Dr. J. Randall Woolridge

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I. INTRODUCTION

1

2 **Q. Please state your full name.**

3 A. My name is J. Randall Woolridge.

4 **Q. By whom are you employed and what is your business address?**

5 A. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal

6 Endowed University Fellow in Business Administration at the University Park

7 Campus of Pennsylvania State University. I am also the Director of the Smeal

8 College Trading Room and President of the Nittany Lion Fund, LLC. A

9 summary of my educational background, research, and related business

10 experience is provided in Appendix A.

11

12 **Q. What is the purpose of your testimony in this proceeding?**

13 A. I have been asked by the Staff of the New Hampshire Public Utilities Commission

14 to provide an opinion as to the overall fair rate of return or cost of capital for the

15 regulated gas distribution service of Liberty Utilities (EnergyNorth Natural Gas)

16 Corp. d/b/a Liberty Utilities ("EnergyNorth" or the "Company") and to evaluate

17 EnergyNorth's rate of return testimony in this proceeding.

18

19 **Q. How is your testimony organized?**

20 A. First, I review my cost of equity recommendation for EnergyNorth, and review the

21 primary areas of contention between EnergyNorth's rate of return position and my

22 position. Second, I discuss the selection of a proxy group of gas distribution

23 companies for estimating the market cost of equity for EnergyNorth. Third, I

1

1   discuss the capital structure of the Company. <u>Fourth</u>, I estimate the equity cost rate

2   for EnergyNorth. <u>Finally</u>, I critique the Company's rate of return analysis and

3   testimony. I have included three appendices. In Appendix B, I provide an

4   assessment of capital costs in today's capital markets. And in Appendix C, I

5   discuss the concept of the cost of equity capital.

6

7   **A. Overview**

8

9   **Q. What comprises a utility's "rate of return"?**

10   A. A company's overall rate of return consists of three main categories: (1) capital

11   structure (i.e., ratios of short-term debt, long-term debt, preferred stock and

12   common equity); (2) cost rates for short-term debt, long-term debt, and preferred

13   stock; and (3) common equity cost, otherwise known as Return on Equity

14   ("ROE").

15

16   **Q. What is a utility's ROE intended to reflect?**

17   A. An ROE is most simply described as the allowed rate of profit for a regulated

18   company. In a competitive market, a company's profit level is determined by a

19   variety of factors, including the state of the economy, the degree of competition a

20   company faces, the ease of entry into its markets, the existence of substitute or

21   complementary products/services, the company's cost structure, the impact of

22   technological changes, and the supply and demand for its services and/or

23   products. For a regulated monopoly, the regulator determines the level of profit

1   available to the utility. The United States Supreme Court established the guiding

2   principles for establishing an appropriate level of profitability for regulated

3   public utilities in two cases: (1) *Bluefield* and (2) *Hope*.[1] In those cases, the

4   Court recognized that the fair rate of return on equity should be: (1) comparable

5   to returns investors expect to earn on other investments of similar risk; (2)

6   sufficient to assure confidence in the company's financial integrity; and (3)

7   adequate to maintain and support the company's credit and to attract capital.

8   Thus, the appropriate ROE for a regulated utility requires determining the

9   market-based cost of capital. The market-based cost of capital for a regulated

10   firm represents the return investors could expect from other investments, while

11   assuming no more and no less risk. The purpose of all of the economic models

12   and formulas in cost of capital testimony (including those presented later in my

13   testimony) is to estimate, using market data of similar-risk firms, the rate of

14   return equity investors require for that risk-class of firms in order to set an

15   appropriate ROE for a regulated firm.

16

17   **Q. Please review the company's proposed rate of return.**

18   A. The Company has proposed a capital structure of 50.0% long-term debt and

19   50.0% common equity. The Company has recommended a long-term debt cost

20   rate of 4.43%. EnergyNorth witness Mr. Robert B. Hevert has recommended a

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[1] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*") and *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

1   common equity cost rate of 10.30% for the gas distribution operations of

2   EnergyNorth. The Company's overall proposed rate of return is 7.37%.

3

4 **Q. What are your recommendations regarding the appropriate rate of return**

5   **for EnergyNorth?**

6 A. I have reviewed the Company's proposed capital structure and overall cost of

7   capital. I have made a slight adjustment to this capital structure and debt cost

8   rate to reflect a recent debt refinancing. I am using the Company's updated

9   proforma capital structure of 0.95% short-term debt, 49.85% long-term debt, and

10   49.21% common equity capital. I am also using the Company's updated short-

11   term and long-term debt cost rates of 2.49% and 4.39%.

12   To estimate an equity cost rate for the Company, I have applied the

13   Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model

14   ("CAPM") to my proxy group of gas distribution companies ("Gas Proxy

15   Group"). Mr. Hevert has also employed an alternative risk premium, which he

16   calls a Bond Yield Risk Premium ("BYRP") approach. My recommendation is

17   that the appropriate ROE for the Company is 8.55%. This figure is at the upper

18   end of my equity cost rate range of 7.9% to 8.55%. Combined with my

19   recommended capitalization ratios and senior capital cost rate, my overall rate of

20   return or cost of capital for the Company is 6.42% as summarized in Exhibit

21   JRW-1.

22

23

1	
2	**B. Primary Rate of Return Issues in this Case**
3	
4	**Q. Please summarize the primary issues regarding rate of return in this**
5	**proceeding.**
6	A. The primary rate of return issue in this case is the appropriate ROE for the
7	Company. As I discuss below, my equity cost rate recommendation is consistent
8	with the current economic environment. A major point of contention in this case
9	are the alternative assumptions regarding capital market conditions between Mr.
10	Hevert and myself.
11	
12	**Q. Please initially review the differences in opinion regarding the state of the**
13	**capital markets and capital costs.**
14	A. Mr. Hevert and I have different opinions regarding capital market conditions.
15	Mr. Hevert's analyses and ROE results and recommendations reflect the
16	assumption of higher interest rates and capital costs. In Appendix B, I review
17	current market conditions and conclude that interest rates and capital costs are at
18	low levels and are likely to remain low for some time. On this issue, I show that
19	the economists' forecasts of higher interest rates and capital costs, which are
20	used by Mr. Hevert, have been consistently wrong for a decade.
21	
22	

1   **Q. On this issue, please review the Federal Reserve's decision to raise the**

2   **federal funds rate.**

3   A. On December 16, 2015, the Federal Reserve increased its target rate for federal

4   funds to 0.25 – 0.50 percent.[2] This increase came after the rate was kept in the

5   0.0 to .25 percent range for over five years in order to spur economic growth in

6   the wake of the financial crisis. As the economy has improved, with lower

7   unemployment, steady but slow GDP growth, improving consumer confidence,

8   and a better housing market, the Federal Reserve has increased the target federal

9   funds rate on three occasions: December, 2016, March, 2017, and June, 2017.

10   The increases were widely anticipated and the markets did not respond in any

11   significant way. The Federal Reserve is also expected to increase the federal

12   funds rate in December of 2017.

13

14   **Q. How have long-term rates responded to the actions of the Federal Reserve?**

15   A. Figure 1 shows the yield on thirty-year Treasury bonds over the 2015-2017 time

16   period. These rates bottomed out in August 2016 and subsequently increased

17   with improvements in the economy. Then came November 8, 2016, and financial

18   markets moved significantly in the wake of the unexpected results in the U.S.

19   presidential election. The stock market gained more than 10% and the 30-year

20   Treasury yield increased about 50 basis points to 3.2% by year-end 2016.

21   During 2017, even as the Federal Reserve increased the federal funds rate in

22   March and June and an additional increase is expected in December, the yield on

---

[2] The federal funds rate is set by the Federal Reserve and is the borrowing rate applicable to the most creditworthy financial institutions when they borrow and lend funds <u>overnight</u> to each other.

1   thirty-year bonds decreased to below 3.0%. The bottom line is that despite

2   increases in the short-term federal funds rate, long-term rates have not increased

3   due to relatively slow economic growth and low inflation.

4
5
6

Figure 1
Thirty-Year Treasury Yield
2015-2017

7

8

9   **Q. What are the differences between your DCF model and Mr. Hevert's DCF**

10   **model?**

11   A. I have employed the traditional constant-growth DCF model. Mr. Hevert has

12   also used this model, as well as a multi-stage growth version of the model.

13   There are several errors in Mr. Hevert's DCF analyses: (1) He has given little to

14   no weight to his constant-growth and multi-stage DCF results; (2) In his

15   constant-growth and multi-stage growth DCF analyses, he has relied exclusively

16   on the overly optimistic and upwardly biased EPS growth rate forecasts of Wall

17   Street analysts and *Value Line;* and (3) In his multi-stage DCF model, he has

18   employed a terminal growth rate of 5.50% which is excessive for a number of

7

1	reasons, especially the fact that it is not reflective of prospective economic growth
2	in the U.S. and is about 100 basis points above the projected long-term growth in
3	U.S. Gross Domestic Product ("GDP"). On the other hand, when developing the
4	DCF growth rate that I have used in my analysis, I have reviewed thirteen growth
5	rate measures including historical and projected growth rate measures and have
6	evaluated growth in dividends, book value, and earnings per share.
7	
8	**Q. Please discuss the differences between your application of the CAPM and that**
9	**of Mr. Hevert.**
10	A. The CAPM approach requires an estimate of the risk-free interest rate, beta, and
11	the market or risk premium. The primary issues with Mr. Hevert's CAPM
12	analyses are an inflated projected risk-free interest rate and an excessive market
13	risk premium ("MRP"), both of which do not reflect current market
14	fundamentals. He employs a near-term projected 30-Yreat Treasury rate that is
15	more than 50 basis points above current market rates. With respect to the MRP,
16	I highlight that there are three methods to estimate a MRP – historical returns,
17	surveys, and expected return models. Mr. Hevert uses projected MRPs of
18	10.28% and 11.05%. Mr. Hevert's projected market risk premiums use analysts'
19	EPS growth rate projections to compute an expected market return and market
20	risk premium. These EPS growth rate projections and the resulting expected
21	market returns and risk premiums include unrealistic assumptions regarding
22	future economic and earnings growth and stock returns. I have used a market risk
23	premium of 5.5%, which: (1) employs three different approaches to estimating a

1   market premium; and (2) uses the results of many studies of the market risk

2   premium. As I note, my market risk premium reflects the market risk premiums:

3   (1) determined in recent academic studies by leading finance scholars; (2)

4   employed by leading investment banks and management consulting firms; and

5   (3) found in surveys of companies, financial forecasters, financial analysts, and

6   corporate CFOs.

7

8   **Q. Have you employed an alternative risk premium model?**

9   A. No. The CAPM is a form of the risk premium model, so I believe that using

10   another form of the risk premium model is unnecessary.

11

12   **Q. Please discuss the errors with Mr. Hevert's alternative BYRP model.**

13   A. Mr. Hevert estimates an equity cost rate using the BYRP model. His BYRP is

14   based on the historical relationship between the yields on long-term Treasury

15   yields and authorized returns on equity ("ROEs") for gas distribution companies.

16   There are several issues with this approach. First, he uses near-term and long-

17   term projected 30-year Treasury yields that are more than 50 and 150 basis

18   points above current market rates. Second, Mr. Hevert's methodology produces

19   an inflated measure of the risk premium because his approach uses historical

20   authorized ROEs and Treasury yields, and the resulting risk premium is applied to

21   projected Treasury yields. Third, Mr. Hevert's BYRP model is a gauge of

22   commission behavior and not investor behavior. Capital costs are determined in

23   the market place through the financial decisions of investors and are reflected in

1   such fundamental factors as dividend yields, expected growth rates, interest

2   rates, and investors' assessment of the risk and expected return of different

3   investments. Regulatory commissions evaluate not only capital market data in

4   setting authorized ROEs, but also take into account other utility- and rate case-

5   specific information in setting ROEs. As such, Mr. Hevert's BYRP approach

6   and results reflect other factors used by utility commissions in authorizing ROEs

7   in addition to capital costs. This may especially be true when the authorized ROE

8   data includes the results of rate cases that are settled and not fully litigated.

9   Finally, the BYRP model is inflated as a measure of investor's required risk

10 premium, since gas distribution companies have been selling at market-to-book

11 ratios in excess of 1.0. This indicates that the authorized rates of return have

12 been greater than the return that investors require.

13 **Q. Are these errors reflected in the differences between Mr. Hevert's BYRP**

14 **results and the average state-level authorized roes for gas distribution**

15 **companies nationwide?**

16 A. Yes.   Mr. Hevert's BYRP equity cost rate estimates for gas distribution

17 companies range from 9.94% to 10.25%. These figures overstate actual state-

18 level authorized ROEs. The authorized ROEs for gas distribution companies

19 have declined over time.   The annual averages were 9.94% in 2012, 9.68% in

20 2013, 9.78% in 2014, 9.60% in 2015, 9.50% in 2016, and 9.61% in the first three

21 quarters of 2017, according to Regulatory Research Associates.[3]

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[3] *Regulatory Focus*, Regulatory Research Associates, October, 2017. This calculation omits 11.88%
ROE for an Alaskan utility, which RRA labels an "outlier."

1

2 **Q. What are the other differences between your equity cost rate analyses and**

3 **Mr. Hevert's?**

4 A. There are two other issues.

5 First, based on a review of adjustment mechanisms and alternative regulation

6 plans for the proxy gas companies, Mr. Hevert claims that the Company's

7 proposed decoupling mechanism does not materially affect the risk of

8 EnergyNorth relative to the proxy group. However, I find that this review is

9 erroneous for three reasons: (1) the proxy companies have a significant

10 percentage of unregulated revenue that is not decoupled; (2) Only three of the

11 seven proxy companies have full decoupling, and one has no decoupling; and (3)

12 Mr. Hevert has not provided an analysis that compares the percent of decoupled

13 customers, revenues, and gas volumes for EnergyNorth and the proxy gas

14 companies. Therefore, I conclude that Mr. Hevert cannot come to the conclusion

15 that the Company's proposed decoupling mechanism does not materially impact

16 its risk relative to the proxy companies.

17 Second, Mr. Hevert's consideration of equity flotation costs and size in his

18 determination of the appropriate ROE for EnergyNorth. With respect to an

19 adjustment for flotation costs, Mr. Hevert has not cited any prospective equity

20 issues by EnergyNorth's parent company. The Company should not be rewarded

21 with a higher ROE that includes flotation costs that the Company does not expect

11

1   to incur. Mr. Hevert's consideration of a size premium is also erroneous, since

2   the size of the Company is a consideration in its credit ratings.

3

1 **Q. Please summarize the primary differences between your position and the**

2 **Company's position regarding the Company's cost of capital.**

3 A. In the end, the most significant areas of disagreement in measuring the

4 Company's cost of capital are:

5 (1) I have used the Company's updated capital structure which includes a recent

6 bond refinancing;

7 (2) Mr. Hevert's analyses and ROE results and recommendations are based on

8 the assumption of higher interest rates and capital costs. I review current market

9 conditions and conclude that interest rates and capital costs are at low levels and

10 are likely to remain low for some time;

11 (3) Mr. Hevert's DCF equity cost rate estimates, and in particular the fact that:

12 (a) He has given very little weight if any to his DCF results; (b) In his constant-

13 growth and multi-stage growth DCF analyses, he has relied exclusively on the

14 overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street

15 analysts and *Value Line*; and (c) In his multi-stage DCF model, he has employed

16 a terminal growth rate of 5.50% which is about 100 basis points above the

17 projected long-term growth in U.S. GDP;

18 (4) The projected interest rates and market or equity risk premiums in Mr.

19 Hevert's CAPM and RP approaches are inflated and are not reflective of market

20 realities or expectations;

21 (5) Mr. Hevert's conclusion with respect to the impact of the Company's

22 decoupling mechanism and his consideration of flotation costs and the size of the

23 Company in arriving at a recommended ROE.

1
2   **II.   PROXY GROUP SELECTION**

3

4 **Q. Please describe your approach to developing a fair rate of return**

5   **recommendation for EnergyNorth.**

6 A. To develop a fair rate of return recommendation for the Company, I have

7   evaluated the return requirements of investors on the common stock of a proxy

8   group of publicly-held gas distribution companies.

9

10 **Q. Please describe your proxy group of gas companies.**

11 A. The Gas Proxy Group consists of seven natural gas distribution companies

12   covered by the *Value Line Investment Survey*. The companies include Atmos

13   Energy, New Jersey Resources, Northwest Natural Gas Company, One Gas, Inc.,

14   South Jersey Industries, Southwest Gas, and Spire, Inc.[4]

15   Summary financial statistics for the Gas Proxy Group are listed on page 1 of

16   Exhibit JRW-4. The median operating revenues and net plant among members of

17   the Gas Proxy Group are \$1,537.3 million and \$3,287.2 million, respectively.

18   The group receives, on average, 74% of revenues from regulated gas operations,

19   and has an 'A-' average issuer credit rating from S&P, a median common equity

20   ratio of 50.9%, and a median earned return on common equity of 9.4%.

---

[4] This is the same group of gas companies used by Mr. Hevert, except that I have included One Gas and have excluded Chesapeake Utilities. I have excluded Chesapeake because it receives the majority of its revenues from regulated electric utility operations.

1

2 **Q. How does the investment risk of the Company compare to that of the Gas**

3 **Proxy Group?**

4 A. I believe that bond ratings provide a good assessment of the investment risk of a

5 company. Exhibit JRW-4 also shows S&P and Moody's issuer credit ratings for

6 the companies in the Gas Proxy Group. These average S&P issuer credit rating

7 for the group is A-. EnergyNorth is not rated by any rating agencies.

8 EnergyNorth's parent, Liberty Utilities, is rated BBB by S&P. However, this is

9 a corporate-wide credit rating for Liberty Utilities ("LU") owner, Algonquin

10 Power and Utilities Corp ("APUC"). APUC owns Algonquin Power Company,

11 an independent power producer as well as LU.   As indicated in a recent S&P

12 report, APUC's credit rating benefits from the stable cash flows of LU.[5] APUC

13 and LU are also rated by DBRS Limited, primarily a credit agency for Canadian

14 companies. The DBRS ratings for APUC and LU are BBB (high).[6] The debt by

15 LUF is unconditionally guaranteed by LU. Overall, these credit ratings suggest

16 that EnergyNorth is at the high end of the investment risk spectrum of the proxy

17 group. However, APUC's unregulated power business, acquisitions, and more

18 highly-levered balance sheet would impact these ratings in a negative way.

19

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[5] Standard & Poor's Rating Services, Algonquin Power & Utilities Corp., November 18, 2015. Provided in response to Staff 3.5, Attachment Staff 3-5.2.
[6] As provided in Company response to Staff 4-5.

1   **Q. How does the investment risk of the gas group compare based on the**

2   **various risk metrics published by *Value Line*?**

3   A. On page 2 of Exhibit JRW-4, I have assessed the riskiness of the gas group using

4   five different risk measures The risk measures include Beta (0.74), Financial

5   Strength (A) Safety (1.7), Earnings Predictability (81), and Stock Price Stability

6   (89). On balance, these measures suggest that the Gas Proxy Group is low risk.

7

8   **III.   CAPITAL STRUCTURE RATIOS AND DEBT COST RATES**

9

10   **Q. Please describe EnergyNorth's proposed capital structure and senior capital**

11   **cost rate.**

12   A. The Company has proposed a capital structure of 50.0% long-term debt and

13   50.0% common equity and a long-term debt cost rate of 4.43%.

14

15   **Q. What are your recommendations regarding the appropriate rate of return**

16   **for EnergyNorth?**

17   A. I have reviewed the Company's proposed capital structure and overall cost of

18   capital. Subsequent to its initial filing in the docket, the Company sought

19   authorization to refinance $18.2 million of its intercompany debt.[7] As of June 30,

20   2017, the Company's projected rate on the new notes was 4.12%.[8] Company

21   witness Mr. Timke than estimates a proforma capital structure that includes

22   0.945% short-term debt, short-term debt, 49.845% long-term debt, and 49.209%

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[7] See Docket No. DG 17-XXXX, Direct Testimony of Mr. Mark T. Timpe.
[8] *Ibid. P. 10.*

1   common equity capital.[9]   The associated updated short-term and long-term debt

2   cost rates are 2.49% and 4.39%. This is summarized inn Exhibit JRW-5, Panel

3   C. I will use this updated capital structure and associated debt cost rates.

4

5   **IV.   THE COST OF COMMON EQUITY CAPITAL**

6   **A.   DCF Analysis**

7

8   **Q. Please describe the theory behind the traditional DCF model.**

9   A. According to the DCF model, the current stock price is equal to the discounted

10   value of all future dividends that investors expect to receive from investment in

11   the firm. As such, stockholders' returns ultimately result from current as well as

12   future dividends. As owners of a corporation, common stockholders are entitled

13   to a *pro rata* share of the firm's earnings. The DCF model presumes that

14   earnings that are not paid out in the form of dividends are reinvested in the firm

15   so as to provide for future growth in earnings and dividends. The rate at which

16   investors discount future dividends, which reflects the timing and riskiness of the

17   expected cash flows, is interpreted as the market's expected or required return on

18   the common stock. Therefore, this discount rate represents the cost of common

19   equity. Algebraically, the DCF model can be expressed as:

20

---

[9] Docket No. DG 17-XXXX, Attachment MTT-1, page 6 of 6.

$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \ldots \frac{D_n}{(1+k)^n}$$

where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

Q. Is the DCF model consistent with valuation techniques employed by investment firms?

A. Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model ("DDM"). The stages in a three-stage DCF model are presented in Exhibit JRW-9, Page 1 of 2. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a maturity (or steady-state) stage. The dividend-payment stage of a firm depends on the profitability of its internal investments which, in turn, is largely a function of the life cycle of the product or service.

1.   Growth stage: Characterized by rapidly expanding sales, high profit margins, and an abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.

1   2.   Transition stage: In later years, increased competition reduces profit

2   margins and earnings growth slows. With fewer new investment opportunities,

3   the company begins to pay out a larger percentage of earnings.

4   3.   Maturity (steady-state) stage: Eventually, the company reaches a

5   position where its new investment opportunities offer, on average, only slightly

6   attractive ROEs. At that time, its earnings growth rate, payout ratio, and ROE

7   stabilize for the remainder of its life.

8   The constant-growth DCF model is appropriate when a firm is in the maturity

9   stage of the life cycle. In using this model to estimate a firm's cost of equity

10   capital, dividends are projected into the future using the different growth rates in

11   the alternative stages, and then the equity cost rate is the discount rate that

12   equates the present value of the future dividends to the current stock price.

13

14   **Q. How do you estimate stockholders' expected or required rate of return**

15   **using the DCF model?**

16   A. Under certain assumptions, including a constant and infinite expected growth

17   rate, and constant dividend/earnings and price/earnings ratios, the DCF model

18   can be simplified to the following:

19
20     $$P = \frac{D_1}{k - g}$$
21
22
23   where D_1 represents the expected dividend over the coming year and g is the

24   expected growth rate of dividends. This is known as the constant-growth version

1   of the DCF model. To use the constant-growth DCF model to estimate a firm's

2   cost of equity, one solves for k in the above expression to obtain the following:

3
4                              $$k = \frac{D_1}{P} + g$$
5
6
7

8   Q. **In your opinion, is the constant-growth DCF model appropriate for public**

9   **utilities?**

10 A. Yes. The economics of the public utility business indicate that the industry is in

11   the steady-state or constant-growth stage of a three-stage DCF. The economics

12   include the relative stability of the utility business, the maturity of the demand

13   for public utility services, and the regulated status of public utilities (especially

14   the fact that their returns on investment are effectively set through the

15   ratemaking process). The DCF valuation procedure for companies in this stage

16   is the constant-growth DCF. In the constant-growth version of the DCF model,

17   the current dividend payment and stock price are directly observable. However,

18   the primary problem and controversy in applying the DCF model to estimate

19   equity cost rates entails estimating investors' expected dividend growth rate.

20

21 Q. **What factors should one consider when applying the DCF methodology?**

22 A. One should be sensitive to several factors when using the DCF model to estimate

23   a firm's cost of equity capital. In general, one must recognize the assumptions

24   under which the DCF model was developed in estimating its components (the

25   dividend yield and the expected growth rate). The dividend yield can be

20

1   measured precisely at any point in time; however, it tends to vary somewhat over

2   time. Estimation of expected growth is considerably more difficult. One must

3   consider recent firm performance, in conjunction with current economic

4   developments and other information available to investors, to accurately estimate

5   investors' expectations.

6

7 **Q. What dividend yields have you reviewed?**

8 A. I have calculated the dividend yields for the companies in the proxy group using

9   the current annual dividend and the 30-day, 90-day, and 180-day average stock

10   prices. These dividend yields are provided on page 2 of Exhibit JRW-10. For the

11   Gas Proxy Group, the median dividend yields using the 30-day, 90-day, and 180-

12   day average stock prices range from 2.5% to 2.6%. I am using the average of the

13   medians, 2.55%, as the dividend yield for the Gas Proxy Group.

14 **Q. Please discuss the appropriate adjustment to the spot dividend yield.**

15 A. According to the traditional DCF model, the dividend yield term relates to the

16   dividend yield over the coming period. As indicated by Professor Myron

17   Gordon, who is commonly associated with the development of the DCF model

18   for popular use, this is obtained by: (1) multiplying the expected dividend over

19   the coming quarter by 4, and (2) dividing this dividend by the current stock price

20   to determine the appropriate dividend yield for a firm that pays dividends on a

21   quarterly basis.[10]

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[10] *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission,

1   In applying the DCF model, some analysts adjust the current dividend for growth

2   over the coming year as opposed to the coming quarter. This can be complicated

3   because firms tend to announce changes in dividends at different times during

4   the year. As such, the dividend yield computed based on presumed growth over

5   the coming quarter as opposed to the coming year can be quite different.

6   Consequently, it is common for analysts to adjust the dividend yield by some

7   fraction of the long-term expected growth rate.

8

9   **Q. Given this discussion, what adjustment factor do you use for your dividend**

10   **yield?**

11   A. I adjust the dividend yield by one-half (1/2) of the expected growth so as to

12   reflect growth over the coming year. The DCF equity cost rate ("K") is computed

13   as:

14
15   $$K = [(D/P) * (1 + 0.5g)] + g$$
16

17   **Q. Please discuss the growth rate component of the DCF model.**

18   A. There is debate as to the proper methodology to employ in estimating the growth

19   component of the DCF model. By definition, this component is investors'

20   expectation of the long-term dividend growth rate. Presumably, investors use

21   some combination of historical and/or projected growth rates for earnings and

22   dividends per share and for internal or book-value growth to assess long-term

23   potential.

Docket No. 79-05, Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

1

2 **Q. What growth data have you reviewed for the proxy group?**

3 A. I have analyzed a number of measures of growth for companies in the proxy

4 group. I reviewed *Value Line's* historical and projected growth rate estimates for

5 earnings per share ("EPS"), dividends per share ("DPS"), and book value per

6 share ("BVPS"). In addition, I utilized the average EPS growth rate forecasts of

7 Wall Street analysts as provided by Yahoo, Reuters and Zacks. These services

8 solicit five-year earnings growth rate projections from securities analysts and

9 compile and publish the means and medians of these forecasts. Finally, I also

10 assessed prospective growth as measured by prospective earnings retention rates

11 and earned returns on common equity.

12

13 **Q. Please discuss historical growth in earnings and dividends as well as internal**

14 **growth.**

15 A. Historical growth rates for EPS, DPS, and BVPS are readily available to

16 investors and are presumably an important ingredient in forming expectations

17 concerning future growth. However, one must use historical growth numbers as

18 measures of investors' expectations with caution. In some cases, past growth

19 may not reflect future growth potential. Also, employing a single growth rate

20 number (for example, for five or ten years) is unlikely to accurately measure

21 investors' expectations, due to the sensitivity of a single growth rate figure to

22 fluctuations in individual firm performance as well as overall economic

23 fluctuations (i.e., business cycles). However, one must appraise the context in

1   which the growth rate is being employed. According to the conventional DCF

2   model, the expected return on a security is equal to the sum of the dividend yield

3   and the expected long-term growth in dividends. Therefore, to best estimate the

4   cost of common equity capital using the conventional DCF model, one must look

5   to long-term growth rate expectations.

6   Internally generated growth is a function of the percentage of earnings

7   retained within the firm (the earnings retention rate) and the rate of return earned

8   on those earnings (the return on equity). The internal growth rate is computed as

9   the retention rate times the return on equity. Internal growth is significant in

10 determining long-run earnings and, therefore, dividends. Investors recognize the

11 importance of internally generated growth and pay premiums for stocks of

12 companies that retain earnings and earn high returns on internal investments.

13

14 **Q. Please discuss the services that provide analysts' EPS forecasts.**

15 A. Analysts' EPS forecasts for companies are collected and published by a number of

16   different investment information services, including Institutional Brokers Estimate

17   System ("I/B/E/S"), Bloomberg, FactSet, Zacks, First Call and Reuters, among

18   others. Thompson Reuters publishes analysts' EPS forecasts under different

19   product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, and

20   Zacks publish their own set of analysts' EPS forecasts for companies.   These

21   services do not reveal: (1) the analysts who are solicited for forecasts; or (2) the

22   identity of the analysts who actually provide the EPS forecasts that are used in the

23   compilations published by the services. I/B/E/S, Bloomberg, FactSet, and First

24

1   Call are fee-based services. These services usually provide detailed reports and

2   other data in addition to analysts' EPS forecasts. Thompson Reuters and Zacks do

3   provide limited EPS forecast data free-of-charge on the internet. Yahoo finance

4   (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary

5   EPS forecasts.   The Reuters website (www.reuters.com) also publishes EPS

6   forecasts from Thompson Reuters, but with more detail. Zacks (www.zacks.com)

7   publishes its summary forecasts on its website. Zacks estimates are also available

8   on other websites, such as msn.money (http://money.msn.com).

9

10   **Q. Please provide an example of these EPS forecasts.**

11   A. The following example provides the EPS forecasts compiled by Reuters for

12   Atmos Energy Corporation (stock symbol "ATO"). The figures are provided on

13   page 2 of Exhibit JRW-9. Line one shows that one analyst has provided EPS

14   estimates for the quarter ending September 30, 2017. The mean, high and low

15   estimates are $0.34, $0.37, and $0.32, respectively. The second line shows the

16   quarterly EPS estimates for the quarter ending December 31, 2017 of $1.55

17   (mean), $1.59 (high), and $1.53 (low).   Line three shows the annual EPS

18   estimates for the fiscal year ending December 2017 ($3.61 (mean), $3.65 (high),

19   and $3.57 (low). Line four shows the annual EPS estimates for the fiscal year

20   ending December 2018 ($3.83 (mean), $3.99 (high), and $3.00 (low).The

21   quarterly and annual EPS forecasts in lines 1-4 are expressed in dollars and

22   cents. As in the ATO case shown here, it is more common for analysts to

23   provide estimates of annual EPS as opposed to quarterly EPS. The bottom line

1   shows the projected long-term EPS growth rate, which is expressed as a

2   percentage. For ATO, one analysts has provided a long-term EPS growth rate

3   forecast, with mean, high, and low growth rates of 6.70%, 6.70%, and 6.70%.

4

5   **Q. Which of these EPS forecasts is used in developing a DCF growth rate?**

6   A. The DCF growth rate is the long-term projected growth rate in EPS, DPS, and

7   BVPS. Therefore, in developing an equity cost rate using the DCF model, the

8   projected long-term growth rate is the projection used in the DCF model.

9

10   **Q. Why do you not rely exclusively on the EPS forecasts of Wall Street analysts in**

11   **arriving at a DCF growth rate for the proxy group?**

12   A. There are several issues with using the EPS growth rate forecasts of Wall Street

13   analysts as DCF growth rates. First, the appropriate growth rate in the DCF

14   model is the dividend growth rate, not the earnings growth rate. Nonetheless,

15   over the very long term, dividend and earnings will have to grow at a similar

16   growth rate. Therefore, consideration must be given to other indicators of

17   growth, including prospective dividend growth, internal growth, as well as

18   projected earnings growth. Second, a recent study by Lacina, Lee, and Xu

19   (2011) has shown that analysts' long-term earnings growth rate forecasts are not

20   more accurate at forecasting future earnings than naïve random walk forecasts of

21   future earnings.[1112] Employing data over a twenty-year period, these authors

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[11] If earning per share follow a random walk, then year-to-year changes in earnings per share are independent. As a result, there is no discernable trend in earnings per share, and the best estimate of next year's earnings per share is this year's earnings per share.

26

1   demonstrate that using the most recent year's EPS figure to forecast EPS in the

2   next 3-5 years proved to be just as accurate as using the EPS estimates from

3   analysts' long-term earnings growth rate forecasts. In the authors' opinion, these

4   results indicate that analysts' long-term earnings growth rate forecasts should be

5   used with caution as inputs for valuation and cost of capital purposes. Finally,

6   and most significantly, it is well known that the long-term EPS growth rate

7   forecasts of Wall Street securities analysts are overly optimistic and upwardly

8   biased. This has been demonstrated in a number of academic studies over the

9   years.[13] Hence, using these growth rates as a DCF growth rate will provide an

10   overstated equity cost rate. On this issue, a study by Easton and Sommers (2007)

11   found that optimism in analysts' growth rate forecasts leads to an upward bias in

12   estimates of the cost of equity capital of almost 3.0 percentage points.[14]

13

14   **Q. Is it your opinion that stock prices reflect the upward bias in the EPS growth**

15   **rate forecasts?**

16   A. Yes, I do believe that investors are well aware of the bias in analysts' EPS

17   growth rate forecasts, and therefore stock prices reflect the upward bias.

[12] M. Lacina, B. Lee & Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

[13] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research (2000);* K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643−684, (2003); M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101; and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

[14] Peter D. Easton & Gregory A. Sommers, *Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts*, 45 J. ACCT. RES. 983–1015 (2007).

1

2 **Q. How does that affect the use of these forecasts in a DCF equity cost rate study?**

3 A. According to the DCF model, the equity cost rate is a function of the dividend yield

4 and expected growth rate. Because stock prices reflect the bias, it would affect the

5 dividend yield. In addition, the DCF growth rate needs to be adjusted downward

6 from the projected EPS growth rate to reflect the upward bias.

7

8 **Q. Please discuss the historical growth of the companies in the proxy group, as**

9 **provided by V*alue Line.***

10 A. Page 3 of Exhibit JRW-10 provides the 5- and 10-year historical growth rates for

11 EPS, DPS, and BVPS for the companies in the three proxy group, as published in

12 the *Value Line Investment Survey*. The median historical growth measures for

13 EPS, DPS, and BVPS for the Gas Proxy Group range from 5.0% to 6.5%, with

14 an average of the medians of 5.7%.

15

16 **Q. Please summarize V*alue Line's* projected growth rates for the companies in**

17 **the proxy group.**

18 A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in

19 the proxy group are shown on page 4 of Exhibit JRW-10. As stated above, due

20 to the presence of outliers, the medians are used in the analysis. For the Gas

21 Proxy Group, as shown on page 4 of Exhibit JRW-10, the medians range from

22 4.5% to 7.0%, with an average of the medians of 5.5%.

1   Also provided on page 4 of Exhibit JRW-10 are the prospective sustainable

2   growth rates for the companies in the two proxy group as measured by *Value*

3   *Line*'s average projected retention rate and return on shareholders' equity. As

4   noted above, sustainable growth is a significant and a primary driver of long-run

5   earnings growth. For the Gas Proxy Group, the median prospective sustainable

6   growth rates is 4.3%.

7

8   **Q. Please assess growth for the proxy group as measured by analysts' forecasts**

9   **of expected 5-year eps growth.**

10   A. Yahoo, Zacks, and Reuters collect, summarize, and publish Wall Street analysts'

11   long-term EPS growth rate forecasts for the companies in the proxy group. These

12   forecasts are provided for the companies in the proxy group on page 5 of Exhibit

13   JRW-10. I have reported both the mean and median growth rates for the group.

14   Since there is considerable overlap in analyst coverage between the three services,

15   and not all of the companies have forecasts from the different services, I have

16   averaged the expected five-year EPS growth rates from the three services for each

17   company to arrive at an expected EPS growth rate for each company. The

18   mean/median of analysts' projected EPS growth rates for the Gas Proxy Group

19   are 5.8% and 6.0%, respectively.[15]

20

21   **Q. Please summarize your analysis of the historical and prospective growth of**

22   **the proxy group.**

---

[15] Given variation in the measures of central tendency of analysts' projected EPS growth rates proxy group, I have considered both the means and medians figures in the growth rate analysis.

1   A. Page 6 of Exhibit JRW-10 shows the summary DCF growth rate indicators for

2   the proxy group.

3   The historical growth rate indicators for my Gas Proxy Group imply a

4   baseline growth rate of 5.7%. The average of the projected EPS, DPS, and

5   BVPS growth rates from *Value Line* is 5.5%, and *Value Line*'s projected

6   sustainable growth rate is 4.3%. The projected EPS growth rates of Wall Street

7   analysts for the Gas Proxy Group are 5.8% and 6.0% as measured by the mean

8   and median growth rates. The overall range for the projected growth rate

9   indicators (ignoring historical growth) is 4.3% to 6.0%. Giving primary weight to

10   the projected EPS growth rate of Wall Street analysts, I believe that the

11   appropriate projected growth rate range is 5.9%. This growth rate figure is

12   clearly in the upper end of the range of historic and projected growth rates for the

13   Gas Proxy Group.

14

15 **Q. What are the results from your application of the DCF model?**

16 A. My DCF-derived equity cost rate for the group are summarized on page 1 of

17   Exhibit JRW-10 and in Table 1 below.

18   **Table 1**
19   **DCF-derived Equity Cost Rate/ROE**

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Gas Proxy Group	**2.55%**	**1.0295**	**5.90%**	**8.55%**

20

1   The result for the Gas Proxy Group is the 2.55% dividend yield, times the

2   one and one-half growth adjustment of 1.0295, plus the DCF growth rate of

3   5.9%, which results in an equity cost rate of 8.55%.

4

5   **B.   Capital Asset Pricing Model**

6

7   **Q. Please discuss the Capital Asset Pricing Model ("CAPM").**

8   A. The CAPM is a risk premium approach to gauging a firm's cost of equity capital.

9   According to the risk premium approach, the cost of equity is the sum of the

10   interest rate on a risk-free bond (R_f) and a risk premium (RP), as in the

11   following:

12   k   = R_f +   RP
13

14   The yield on long-term U.S. Treasury securities is normally used as R_f. Risk

15   premiums are measured in different ways. The CAPM is a theory of the risk and

16   expected returns of common stocks.   In the CAPM, two types of risk are

17   associated with a stock: firm-specific risk or unsystematic risk, and market or

18   systematic risk, which is measured by a firm's beta. The only risk that investors

19   receive a return for bearing is systematic risk.

20   According to the CAPM, the expected return on a company's stock, which is

21   also the equity cost rate (K), is equal to:

22       $K = (R_f) + \text{ß} * [E(R_m) - (R_f)]$
23
24   Where:
25   K represents the estimated rate of return on the stock;
26   $E(R_m)$ represents the expected return on the overall stock market. Frequently, the

31

1	'market' refers to the S&P 500;
2	(R_f) represents the risk-free rate of interest;
3	*[E(R_m) - (R_f)]* represents the expected equity or market risk premium—the
4	excess return that an investor expects to receive above the risk-free rate for
5	investing in risky stocks; and
6	*Beta*—(ß) is a measure of the systematic risk of an asset.
7	

8   To estimate the required return or cost of equity using the CAPM requires three

9   inputs: the risk-free rate of interest (R_f), the beta (ß), and the expected equity or

10   market risk premium *[E(R_m) - (R_f)]*. R_f is the easiest of the inputs to measure –

11   it is represented by the yield on long-term U.S. Treasury bonds. ß, the measure

12   of systematic risk, is a little more difficult to measure because there are different

13   opinions about what adjustments, if any, should be made to historical betas due

14   to their tendency to regress to 1.0 over time. And finally, an even more difficult

15   input to measure is the expected equity or market risk premium *(E(R_m) - (R_f))*. I

16   will discuss each of these inputs below.

17

18   **Q. Please discuss Exhibit JRW-11.**

19   A. Exhibit JRW-11 provides the summary results for my CAPM study. Page 1

20   shows the results, and the following pages contain the supporting data.

21

1   **Q. Please discuss the risk-free interest rate.**

2   A. The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-

3   free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds,

4   in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year

5   maturities.

6

7   **Q. What risk-free interest rate are you using in your CAPM?**

8   A. As shown on page 2 of Exhibit JRW-11, the yield on 30-year U.S. Treasury bonds

9   has been in the 2.5% to 4.0% range over the 2013–2017 time period. The 30-

10   year Treasury yield is currently in the middle of this range. Given the recent

11   range of yields and the possibility of higher interest rates, I use 4.0% as the risk-

12   free rate, or R_f, in my CAPM.

13

14   **Q. Does your 4.0% risk-free interest rate take into consideration forecasts of**

15   **higher interest rates?**

16   A. No. As I stated before, forecasts of higher interest rates have been notoriously

17   wrong for a decade. My 4.0% risk-free interest rate takes into account the range of

18   interest rates in the past and effectively synchronizes the risk-free rate with the

19   market risk premium ("MRP"). The risk-free rate and the MRP are interrelated in

20   that the MRP is developed in relation to the risk-free rate. As discussed below,

21   my MRP is based on the results of many studies and surveys that have been

22   published over time. Therefore, my risk-free interest rate of 4.0% is effectively a

23   normalized risk-free rate of interest.

1

2　**Q. What Betas are you employing in your CAPM?**

3　A. Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken

4　　　to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price

5　　　movement as the market also has a beta of 1.0. A stock whose price movement

6　　　is greater than that of the market, such as a technology stock, is riskier than the

7　　　market and has a beta greater than 1.0. A stock with below average price

8　　　movement, such as that of a regulated public utility, is less risky than the market

9　　　and has a beta less than 1.0. Estimating a stock's beta involves running a linear

10　　regression of a stock's return on the market return.

11　　　As shown on page 3 of Exhibit JRW-11, the slope of the regression line is the

12　　stock's ß. A steeper line indicates that the stock is more sensitive to the return

13　　on the overall market. This means that the stock has a higher ß and greater-than-

14　　average market risk. A less steep line indicates a lower ß and less market risk.

15　　Several online investment information services, such as Yahoo and Reuters,

16　　provide estimates of stock betas. Usually these services report different betas for

17　　the same stock. The differences are usually due to: (1) the time period over

18　　which ß is measured; and (2) any adjustments that are made to reflect the fact

19　　that betas tend to regress to 1.0 over time. In estimating an equity cost rate for

20　　the proxy group, I am using the betas for the companies as provided in the *Value*

21　　*Line Investment Survey*. As shown on page 3 of Exhibit JRW-11, the median

22　　beta for the companies in the Gas Proxy group is 0.70.

23

1   **Q. Please discuss the market risk premium ("MRP").**

2   A. The MRP is equal to the expected return on the stock market (e.g., the expected

3   return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest (R_f)). The MRP

4   is the difference in the expected total return between investing in equities and

5   investing in "safe" fixed-income assets, such as long-term government bonds.

6   However, while the MRP is easy to define conceptually, it is difficult to measure

7   because it requires an estimate of the expected return on the market - $E(R_m)$. As

8   is discussed below, there are different ways to measure $E(R_m)$, and studies have

9   come up with significantly different magnitudes for $E(R_m)$. As Merton Miller,

10   the 1990 Nobel Prize winner in economics indicated, $E(R_m)$ is very difficult to

11   measure and is one of the great mysteries in finance.[16]

12   **Q. Please discuss the alternative approaches to estimating the MRP.**

13   A. Page 4 of Exhibit JRW-11 highlights the primary approaches to, and issues in,

14   estimating the expected MRP. The traditional way to measure the MRP was to

15   use the difference between historical average stock and bond returns.   In this

16   case, historical stock and bond returns, also called ex post returns, were used as

17   the measures of the market's expected return (known as the *ex ante* or forward-

18   looking expected return). This type of historical evaluation of stock and bond

19   returns is often called the "Ibbotson approach" after Professor Roger Ibbotson,

20   who popularized this method of using historical financial market returns as

---

[16] Merton Miller, "The History of Finance: An Eyewitness Account," *Journal of Applied Corporate Finance*, 2000, P. 3.

1   measures of expected returns. Most historical assessments of the equity risk

2   premium suggest an equity risk premium range of 5% to 7% above the rate on

3   long-term U.S. Treasury bonds. However, this can be a problem because: (1) ex

4   post returns are not the same as *ex ante* expectations; (2) market risk premiums

5   can change over time, increasing when investors become more risk-averse and

6   decreasing when investors become less risk-averse; and (3) market conditions

7   can change such that ex post historical returns are poor estimates of *ex ante*

8   expectations.

9   The use of historical returns as market expectations has been criticized in

10   numerous academic studies as discussed later in my testimony. The general

11   theme of these studies is that the large equity risk premium discovered in

12   historical stock and bond returns cannot be justified by the fundamental data.

13   These studies, which fall under the category "Ex Ante Models and Market Data,"

14   compute *ex ante* expected returns using market data to arrive at an expected

15   equity risk premium. These studies have also been called "Puzzle Research"

16   after the famous study by Mehra and Prescott in which the authors first

17   questioned the magnitude of historical equity risk premiums relative to

18   fundamentals.[17]

19   In addition, there are a number of surveys of financial professionals

20   regarding the MRP. There have also been several published surveys of

21   academics on the equity risk premium. *CFO Magazine* conducts a quarterly

22   survey of CFOs, which includes questions regarding their views on the current

---

[17] Rajnish Mehra & Edward C. Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics,* 145 (1985).

1   expected returns on stocks and bonds. Usually, over 300 CFOs participate in the

2   survey.[18] Questions regarding expected stock and bond returns are also included

3   in the Federal Reserve Bank of Philadelphia's annual survey of financial

4   forecasters, which is published as the *Survey of Professional Forecasters*.[19] This

5   survey of professional economists has been published for almost fifty years. In

6   addition, Pablo Fernandez conducts annual surveys of financial analysts and

7   companies regarding the equity risk premiums they use in their investment and

8   financial decision-making.[20]

9

10   **Q. Please provide a summary of the MRP studies.**

11   A. Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the

12   most comprehensive reviews to date of the research on the MRP.[21] Derrig and

13   Orr's study evaluated the various approaches to estimating MRPs, as well as the

14   issues with the alternative approaches and summarized the findings of the

15   published research on the MRP. Fernandez examined four alternative measures

16   of the MRP – historical, expected, required, and implied. He also reviewed the

17   major studies of the MRP and presented the summary MRP results. Song

---

[18]*See* DUKE/CFO Magazine Global Business Outlook Survey, www.cfosurvey.org, September, 2016).

[19] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters (Feb, 2016).* The Survey of Professional Forecasters was formerly conducted by the American Statistical Association ("ASA") and the National Bureau of Economic Research ("NBER") and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

[20] Pablo Fernandez, Alberto Ortiz and Isabel Fernandez Acín, "Market Risk Premium used in 71 countries in 2016: a survey with 6,932 answers: survey," May 9, 2016.

[21] *See* Richard Derrig & Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003); Pablo Fernandez, "Equity Premium: Historical, Expected, Required, and Implied," IESE Business School Working Paper, (2007); Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

1   provides an annotated bibliography and highlights the alternative approaches to

2   estimating the MRP.

3   Page 5 of Exhibit JRW-11 provides a summary of the results of the primary

4   risk premium studies reviewed by Derrig and Orr, Fernandez, and Song, as well

5   as other more recent studies of the MRP. In developing page 5 of Exhibit JRW-

6   11, I have categorized the studies as discussed on page 4 of Exhibit JRW-11. I

7   have also included the results of studies of the "Building Blocks" approach to

8   estimating the equity risk premium. The Building Blocks approach is a hybrid

9   approach employing elements of both historical and *ex ante* models.

10

11   **Q. Please discuss page 5 of Exhibit JRW-11.**

12   A. Page 5 of JRW-11 provides a summary of the results of the MRP studies that I

13   have reviewed.   These include the results of: (1) the various studies of the

14   historical risk premium, (2) *ex ante* MRP studies, (3) MRP surveys of CFOs,

15   financial forecasters, analysts, companies and academics, and (4) the Building

16   Blocks approach to the MRP. There are results reported for over thirty studies,

17   and the median MRP is 4.63%.

18   **Q. Please highlight the results of the more recent risk premium studies and**

19   **surveys.**

20   A. The studies cited on page 5 of Exhibit JRW-11 include every MRP study and

21   survey I could identify that was published over the past decade and that provided

22   an MRP estimate. Most of these studies were published prior to the financial

23   crisis that began in 2008. In addition, some of these studies were published in

1   the early 2000s at the market peak. It should be noted that many of these studies

2   (as indicated) used data over long periods of time (as long as fifty years of data)

3   and so were not estimating an MRP as of a specific point in time (e.g., the year

4   2001).   To assess the effect of the earlier studies on the MRP, I have

5   reconstructed page 5 of Exhibit JRW-11 on page 6 of Exhibit JRW-11; however,

6   I have eliminated all studies dated before January 2, 2010. The median for this

7   subset of studies is 5.07%.

8   **Q. Given these results, what MRP are you using in your CAPM?**

9   A. Much of the data indicates that the market risk premium is in the 4.0% to 6.0%

10   range.   Several recent studies (such as Damodaran, Fernandez, American

11   Appraisers, Duarte and Rosa, and Duff & Phelps) have suggested an increase in

12   the market risk premium. Therefore, I will use 5.5%, which is in the upper end

13   of the range, as the market risk premium or MRP.

14

15   **Q. Is your *ex ante* MRP consistent with the MRPs used by CFOs?**

16   A. Yes.   In the September 2017 CFO survey conducted by *CFO Magazine* and

17   Duke University, which included approximately 300 responses, the expected 10-

18   year MRP was 4.32%.[22] Thus, my 5.5% value is a conservatively high estimate

19   of the MRP.

20

21   **Q. Is your *ex ante* MRP consistent with the MRPs of professional forecasters?**

---

[22] *Id*. p. 42.

1   A. The financial forecasters in the previously referenced Federal Reserve Bank of

2   Philadelphia survey projected both stock and bond returns. In the February 2017

3   survey, the median long-term expected stock and bond returns were 5.60% and

4   3.68%, respectively. This provides an expected MRP of 1.92% (5.60%-3.68%).

5   Again, my 5.5% value is a conservatively high estimate of the MRP.

6

7   Q. **Is your *ex ante* MRP consistent with the MRPs of financial analysts and**

8   **companies?**

9   A. Yes. Pablo Fernandez published the results of his 2017 survey of academics,

10   financial analysts, and companies.[23] This survey included over 4,000 responses.

11   The median MRP employed by U.S. analysts and companies was 5.7%.

12

13   Q. **Is your *ex ante* MRP consistent with the MRPs of financial advisors?**

14   A. Yes. Duff & Phelps is a well-known valuation and corporate finance advisor that

15   publishes extensively on the cost of capital.   As of 2017, Duff & Phelps

16   recommended using a 5.5% MRP for the U.S, with a normalized risk-free

17   interest rate of 3.5%.[24]

18

19   Q. **What equity cost rate is indicated by your CAPM analysis?**

20   A. The results of my CAPM study for the proxy group are summarized on page 1 of

21   Exhibit JRW-11 and in Table 2 below.

---

[23] *Ibid.* p. 3.
[24] *See* http://www.duffandphelps.com/insights/publications/cost-of-capital/index.

Table 2
CAPM-derived Equity Cost Rate/ROE
$$K = (R_f) + \beta * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Gas Proxy Group	4.0%	0.70	5.5%	7.90%

For the Gas Proxy Group, the risk-free rate of 4.0% plus the product of the beta

of 0.70 times the equity risk premium of 5.5% results in a 7.90% equity cost rate.

D. Equity Cost Rate Summary

Q. Please summarize the results of your equity cost rate studies.

A. My DCF and CAPM analyses for the Gas Proxy Group indicate equity cost rates

of 8.55% and 7.90%, respectively.

Table 3
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Gas Proxy Group	8.55%	7.90%

Q. Given these results, what is your estimated equity cost rate for the group?

A. Given these results, I conclude that the appropriate equity cost rate for

companies in the Gas Proxy group is in the 7.90% to 8.55% range. However,

since I rely primarily on the DCF model, I am using the upper end of the range as

the equity cost rate. In addition, given that EnergyNorth is in the upper end of

the spectrum of the investment risk of the proxy group companies, I conclude

that the appropriate equity cost rate for the Company is 8.55%.

1 **Q. Please indicate why an equity cost rate of 8.55% is appropriate for the gas**

2 **operations of EnergyNorth.**

3 A. There are a number of reasons why an equity cost rate of 8.55% is appropriate

4 and fair for the Company in this case:

5   1. As shown in Exhibits JRW-2 and JRW-3, capital costs for utilities, as

6   indicated by long-term bond yields, are still at low levels. In addition, given low

7   inflationary expectations and slow global economic growth, interest rates are

8   likely to remain at low levels for some time.

9   2. As shown in Exhibit JRW-8, the gas distribution industry is among the

10   lowest risk industries in the U.S. as measured by beta. As such, the cost of

11   equity capital for this industry is amongst the lowest in the U.S., according to the

12   CAPM.

13   4. The investment risk of EnergyNorth, as indicated by the Company's S&P

14   and DBRS credit ratings, is at the upper end of the risk level of the two proxy

15   group. Therefore, I have used the upper end of the equity cost rate range

16   (8.55%).

17   5. These authorized ROEs for gas distribution companies have declined in

18   recent years. The average authorized ROE was 10.01% in 2012, 9.8% in 2013,

19   9.76% in 2014, 9.58% in 2015, 9.54% in 2016, and 9.61% in 2017 according to

20   Regulatory Research Associates.[25] In my opinion, these authorized ROEs have

21   lagged behind capital market cost rates, or in other words, authorized ROEs have

22   been slow to reflect low capital market cost rates. Hence, I believe that my

---

[25] *Regulatory Focus*, Regulatory Research Associates, October, 2017. This calculation omits 11.88% ROE for an Alaskan utility, which RRA labels an "outlier."

1   recommended ROE reflects our present low capital cost rates, and these low

2   capital cost rates are now being recognized by state utility commissions.

3

4   **Q. Please discuss your recommendation in light of a recent Moody's**

5   **publication on the subject of utility company ROEs and credit quality.**

6   A. Moody's recently published an article on utility ROEs and credit quality. In the

7   article, Moody's recognizes that authorized ROEs for electric and gas companies

8   are declining due to lower interest rates. [26]

9   The credit profiles of US regulated utilities will remain intact over
10   the next few years despite our expectation that regulators will
11   continue to trim the sector's profitability by lowering its authorized
12   returns on equity (ROE). Persistently low interest rates and a
13   comprehensive suite of cost recovery mechanisms ensure a low
14   business risk profile for utilities, prompting regulators to scrutinize
15   their profitability, which is defined as the ratio of net income to
16   book equity. We view cash flow measures as a more important
17   rating driver than authorized ROEs, and we note that regulators
18   can lower authorized ROEs without hurting cash flow, for instance
19   by targeting depreciation, or through special rate structures.
20

21   Moody's indicates that with the lower authorized ROEs, electric and gas

22   companies are earning ROEs of 9.0% to 10.0%, but this is not impairing their

23   credit profiles and is not deterring them from raising record amounts of capital.

24   With respect to authorized ROEs, Moody's recognizes that utilities and

25   regulatory commissions are having trouble justifying higher ROEs in the face of

26   lower interest rates and cost recovery mechanisms. [27]

---

[26] Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.
[27] Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.

|	
1	Robust cost recovery mechanisms will help ensure that US
2	regulated utilities' credit quality remains intact over the next few
3	years. As a result, falling authorized ROEs are not a material credit
4	driver at this time, but rather reflect regulators' struggle to justify
5	the cost of capital gap between the industry's authorized ROEs and
6	persistently low interest rates. We also see utilities struggling to
7	defend this gap, while at the same time recovering the vast
8	majority of their costs and investments through a variety of rate
9	mechanisms.
10	
11	Overall, this article further supports the prevailing/emerging belief that lower
12	authorized ROEs are unlikely to hurt the financial integrity of utilities or their
13	ability to attract capital.
14	
15	**Q. Do you believe that your 8.55% ROE recommendation meets *Hope* and**
16	***Bluefield* standards?**
17	A. Yes. As previously noted, according to the *Hope* and *Bluefield* decisions, returns
18	on capital should be: (1) comparable to returns investors expect to earn on other
19	investments of similar risk; (2) sufficient to assure confidence in the company's
20	financial integrity; and (3) adequate to maintain and support the company's
21	credit and to attract capital.
22	EnergyNorth earned a ROE of 8.90% in 2016.[28] Utilities have been earning
23	ROEs of about 9.0% (on average) in recent years. As shown on page 1 of
24	Exhibit JRW-4, the median earned ROE for the year 2016 for the companies in
25	the Gas Proxy Group is 9.4%. Given this level of return, the credit ratings of
26	utility companies are going up. Figure 2 shows the rating actions from 2003-

---

[28] Company response to Staff No. 4-6.

1   2017.[29] The bottom line is the number of rating actions, and the top line is the

2   percentage of upgrades. The percentage of upgrades have been at least 70% over

3   the past four years. This provides direct evidence that the investment risk of

4   utility companies is low and declining.

5   **Figure 2**
6   **Electric Utility Rating Actions and Percentage of Credit Upgrades**
7   **2003-2017**
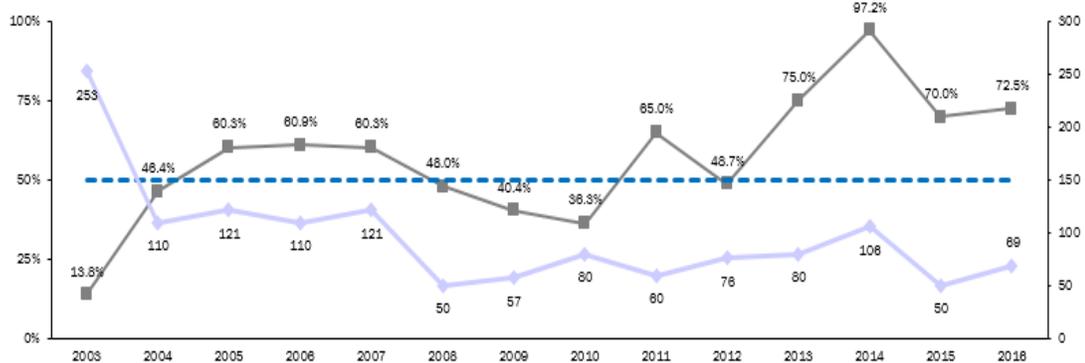
8
9   Source: Edison Electric Institute, 2017.

10

11 **Q. Are utilities able to attract capital with the lower ROEs?**

12 A. Moody's also highlights in the article that utilities are raising about $50 billion a

13   year in debt capital, despite the lower ROEs.[30] Therefore, I believe that my ROE

14   recommendation meets the criteria established in the *Hope* and *Bluefield*

15   decisions.

16 **Q. Have the lower ROEs hurt the stock performance of utility stocks?**

17 A. No.   Figure 3 shows the Dow Jones Utility Index ("DJU") versus the S&P 500

18   since January 1, 2017.[31]   Both the DJU and the S&P 500 are near or have

---

[29] http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/QtrlyFinancialUpdates/Pages/default.aspx
[30] *Ibid.*
[31] https://finance.yahoo.com/.

1   achieved record levels, and the DJU has performed right along with the S&P 500

2   over this time period. As a result, with high stock prices, utility dividend yields

3   and DCF equity cost rates are low.

4
5   **Figure 4**
6   **Dow Jones Utilities vs. S&P 500**
7   **2017**

8
9
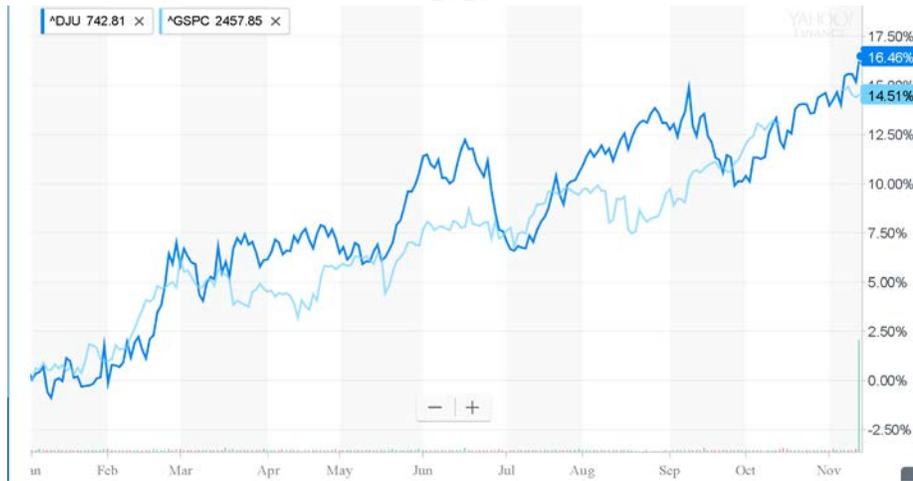
10   **V.   CRITIQUE OF ENERGYNORTH'S RATE OF RETURN**

11   **TESTIMONY**

12

13   **Q. Please summarize the company's rate of return recommendation.**

14   A. The Company has proposed a capital structure of 50.0% long-term debt and

15   50.0% common equity. The Company has recommended a long-term debt cost

16   rate of 4.43%. Mr. Hevert has recommended a common equity cost rate of

17   10.30% for the gas distribution operations of EnergyNorth. The Company's

18   overall proposed rate of return is 7.37%. This is summarized in Exhibit JRW-12.

19

1   **Q. Please review Mr. Hevert's equity cost rate approaches and results.**

2   A. Mr. Hevert has developed a proxy group of gas distribution companies and

3   employs DCF, CAPM, and RP equity cost rate approaches. Mr. Hevert's equity

4   cost rate estimates for the Company are summarized on page 1 of Exhibit JRW-

5   13. Based on these figures, he concludes that the appropriate equity cost rate for

6   the Company is 10.30%. As I discuss below, there are a number of issues with

7   the inputs, applications, and results of his equity cost rate models.

8

9   **Q. What issues do you have with the Company's cost of capital position?**

10   A. The most significant areas of disagreement in measuring the Company's cost of

11   capital are:

12

13   (1) I have used the Company's updated capital structure which includes a recent

14   bond refinancing;

15   (2) Mr. Hevert's analyses and ROE results and recommendations are based on

16   the assumption of higher interest rates and capital costs. I review current market

17   conditions and conclude that interest rates and capital costs are at low levels and

18   are likely to remain low for some time;

19   (3) Mr. Hevert's DCF equity cost rate estimates, and in particular the fact that:

20   (a) He has given very little weight if any to his DCF results; (b) In his constant-

21   growth and multi-stage growth DCF analyses, he has relied exclusively on the

22   overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street

23   analysts and *Value Line*; and (c) In his multi-stage DCF model, he has employed

1   a terminal growth rate of 5.50% which is about 100 basis points above the

2   projected long-term growth in U.S. GDP;

3   (4) The projected interest rates and market or equity risk premiums in Mr.

4   Hevert's CAPM and RP approaches are inflated and are not reflective of market

5   realities or expectations;

6   (5) Mr. Hevert's conclusion with respect to the impact of the Company's

7   decoupling mechanism and his consideration of flotation costs and the size of the

8   Company in arriving at a recommended ROE.

9

10   **A.   The Company's DCF Approach**

11

12   **Q. Please summarize Mr. Hevert's DCF estimates.**

13   A. On pages 15-36 of his testimony and in Attachments RBH-3 - RBH-4, Mr. Hevert

14   develops an equity cost rate by applying the DCF model to the Hevert Proxy

15   Group. Mr. Hevert's DCF results are summarized in Panel A of page 1 of Exhibit

16   JRW-13. He uses constant-growth and multistage growth DCF models. Mr.

17   Hevert uses three dividend yield measures (30, 90, and 180 days) in his DCF

18   models. In his constant-growth DCF models, Mr. Hevert has relied on the

19   forecasted EPS growth rates of Zacks, First Call, and *Value Line*. His multi-stage

20   DCF model uses analysts' EPS growth rate forecasts as a short-term growth rate

21   and his projection of GDP growth as the long-term growth rate. For all three

22   models, he reports Mean Low, Mean, and Mean High results

23

1 **Q. What are the errors in Mr. Hevert's DCF analyses?**

2 A. The primary issues in Mr. Hevert's DCF analyses are: (1) the lack of weight he

3 gives to his constant-growth DCF results, (2) his exclusively use of the overly

4 optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts

5 and *Value Line*, and (3) the use of an inflated terminal growth rate of 5.50% in

6 his multi-stage DCF model that it is not reflective of prospective economic growth

7 in the U.S. and is about 100 basis points above the projected long-term GDP

8 growth;

9
10   1. The Low Weight Given to the Constant-Growth DCF Results
11
12
13 **Q. How much weight has Mr. Hevert given his DCF results in arriving at an**

14 **equity cost rate for the company?**

15 A. Apparently, very little, if any at all. The average of all of his mean constant-growth

16 and multi-stage stage DCF equity cost rates is only 8.80%. Had he given these

17 results more weight, or even any weight, he would have arrived at a much lower

18 equity cost rate recommendation.

19
20   2. Analysts' EPS Growth Rate Forecasts

21

22 **Q. Please discuss Mr. Hevert's exclusive reliance on the projected growth rates**

23 **of Wall Street analysts and *Value Line*.**

24 A. It seems highly unlikely that investors today would rely exclusively on the EPS

25 growth rate forecasts of Wall Street analysts and ignore other growth rate

1   measures in arriving at their expected growth rates for equity investments. As I

2   previously indicated, the appropriate growth rate in the DCF model is the

3   dividend growth rate, not the earnings growth rate. Hence, consideration must

4   be given to other indicators of growth, including historical prospective dividend

5   growth, internal growth, as well as projected earnings growth. In addition, a

6   recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term

7   earnings growth rate forecasts are not more accurate at forecasting future

8   earnings than naïve random walk forecasts of future earnings.[32] As such, the

9   weight give to analysts' projected EPS growth rates should be limited. And

10   finally, and most significantly, it is well-known that the long-term EPS growth

11   rate forecasts of Wall Street securities analysts are overly optimistic and

12   upwardly biased.[33]   Hence, using these growth rates as a DCF growth rate

13   produces an overstated equity cost rate. A recent study by Easton and Sommers

14   (2007) found that optimism in analysts' earnings growth rate forecasts leads to

15   an upward bias in estimates of the cost of equity capital of almost 3.0 percentage

16   points.[34] Therefore, exclusive reliance on these forecasts for a DCF growth rate

17   results in failure of one the basic inputs in the equation.

18

19   3.   The GDP Growth Rate in the Multi-Stage DCF Analysis

20

---

[32] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101
[33] See references in footnote 13.
[34] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

1   **Q. Please discuss Mr. Hevert's multi-stage DCF analysis.**

2   A. Mr. Hevert has employed a multi-stage growth DCF model; (1) the first-stage is

3   the average projected analyst growth rate of Wall Street analysts as published by

4   First Call, Zacks, and *Value Line;* and (2) the terminal stage is his projected

5   measure of long-term GDP growth. He uses a long-term nominal GDP growth

6   rate of 5.50% which is based on (1) a real GDP growth rate of 3.22% which is

7   calculated over the 1929-2016 time period and (2) an inflation rate of 2.21%.

8

9   **Q. What are the primary errors with Mr. Hevert's multi-stage DCF analysis?**

10   A There are two primary errors with Mr. Hevert's multi-stage DCF analysis; (1) the

11   first-stage DCF growth rate is the average projected EPS growth rate from Wall

12   Street analysis which, as discussed above, are overly optimistic and upwardly

13   biased; and (2) the long-term GDP growth rate is based on historical GDP growth

14   and is about 100 basis points above long-term projections of GDP growth.

15

16   **Q. Please identify the errors with Mr. Hevert's projected long-term GDP**

17   **growth rate of 5.50%.**

18   A. There are two major errors in this analysis. First, Mr. Hevert has not provided any

19   theoretical or empirical support that long-term GDP growth is a reasonable proxy

20   for the expected growth rate of the companies in his proxy group. Five-year and

21   ten-year historic measures of growth for earnings and dividends for gas distribution

22   companies, as shown on page 3 of Exhibit JRW-10, suggest growth that is about

23   100 basis points below Mr. Hevert's 5.50% GDP growth rate. Mr. Hevert has

1   provided no evidence as to why investors would rely on his estimate of long-term

2   GDP growth as the appropriate growth rate for gas distribution companies.

3   The second error is the magnitude of Mr. Hevert's long-term GDP growth rate

4   estimate of 5.50%. On page 1 of Exhibit JRW-14 of my testimony, I provide an

5   analysis of GDP growth since 1960. Since 1960, nominal GDP has grown at a

6   compounded rate of 6.51%. Whereas GDP has grown at a compounded rate of

7   6.51% since 1960, economic growth in the U.S. has slowed considerably in

8   recent decades. Page 2 of Exhibit JRW-14 provides the nominal annual GDP

9   growth rates over the 1961 to 2015 time period. Nominal GDP growth grew

10   from 6.0% to over 12% from the 1960s to the early 1980s due in large part to

11   inflation and higher prices. With the exception of an uptick during the mid-

12   2000s, annual nominal GDP growth rates have declined to the 3.5% to 4.0%

13   range over the past five years.

14   The components of nominal GDP growth are real GDP growth and inflation.

15   Page 3 of Exhibit JRW-14 shows annual real GDP growth rate over the 1961 to

16   2015 time period. Real GDP growth has gradually declined from the 5.0% to

17   6.0% range in the 1960s to the 2.0% to 3.0% during the most recent five year

18   period. The second component of nominal GDP growth is inflation. Page 4 of

19   Exhibit JRW-14 shows inflation as measured by the annual growth rate in the

20   Consumer Price Index (CPI) over the 1961 to 2015 time period. The large

21   increase in prices from the late 1960s to the early 1980s is readily evident.

22   Equally evident is the rapid decline in inflation during the 1980s as inflation

1   declined from above 10% to about 4%. Since that time inflation has gradually

2   declined and has been in the 2.0% range or below over the past five years.

3   The graphs on pages 2, 3, and 4 of Exhibit JRW-14 provide very clear

4   evidence of the decline in nominal GDP as well as its components, real GDP and

5   inflation, in recent decades. To gauge the magnitude of the decline in nominal

6   GDP growth, Table 4 and page 5 of Exhibit JRW-15 provide the compounded

7   GDP growth rates for 10-, 20-, 30-, 40- and 50- years.   Whereas the 50-year

8   compounded GDP growth rate is 6.45%, there has been a monotonic and significant

9   decline in nominal GDP growth over subsequent 10-year intervals, especially in the

10   most recent 10 year interval.   These figures clearly suggest that nominal GDP

11   growth in recent decades has slowed and that a growth rate in the range of 4.0% to

12   5.0% is more appropriate today for the U.S. economy. Mr. Hevert's long-term

13   GDP growth rate of 5.50% is clearly inflated.

14   **Table 4**
15   **Historic GDP Growth Rates**

10-Year Average	2.97%
20-Year Average	4.23%
30-Year Average	4.77%
40-Year Average	5.90%
50-Year Average	6.45%

16
17
18   **Q. Are the lower GDP growth rates of recent decades consistent with the**

19   **forecasts of GDP growth?**

20   A. Yes. A lower range is also consistent with long-term GDP forecasts. There are

21   several forecasts of annual GDP growth that are available from economists and

22   government agencies. These are listed in Panel B of on page 5 of Exhibit JRW-14.

1   The mean 10-year nominal GDP growth forecast (as of February 2017) by

2   economists in the recent *Survey of Financial Forecasters* is 4.7%. The Energy

3   Information Administration ("EIA"), in its projections used in preparing *Annual*

4   *Energy Outlook,* forecasts long-term GDP growth of 4.2% for the period 2017-

5   2050.[35] The Congressional Budget Office ("CBO"), in its forecasts for the period

6   2017 to 2047, projects a nominal GDP growth rate of 4.0%.[36] Finally, the Social

7   Security Administration ("SSA"), in its Annual OASDI Report, provides a

8   projection of nominal GDP from 2017-2095.[37] SSA's projected growth GDP

9   growth rate over this period is 4.4%.

10

11   **Q. Does Mr. Hevert provide any reasons why he has ignored the well-known**

12   **long-term GDP forecasts of the CBO, SSA, and EIA?**

13   A. No.

14

15   **Q. In your opinion, what is wrong with Mr. Hevert's real GDP forecast on**

16   **historic data and ignoring the well-known long-term GDP forecasts of the**

17   **CBO, SSA, and EIA?**

18   A. In developing a DCF growth rate for his constant-growth DCF analysis, Mr. Hevert

19   has totally ignored <u>historic</u> EPS, DPS, and BVPS data and relied solely on the long-

---

[35]Energy Information Administration, A*nnual Energy Outlook,*
https://www.eia.gov/outlooks/aeo/data/browser/#/?id=18-AEO2017&cases=ref2017&sourcekey=0
[36]Congressional Budget Office, The *2017 Long-Term Budget Outlook*, March 2017.
https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/52480-ltbo.pdf (Table A-1, p. 30).
[37] Social Security Administration, 2017 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program. https://www.ssa.gov/oact/tr/2017/tr2017.pdf, Table VI.G4, p. 211. The 4.4% represents the compounded growth rate in projected GDP from $19,455 trillion in 2017 to $564,614 trillion in 2095.

54

1   term EPS growth rate projections of Wall Street analysts and *Value Line*. However,

2   in developing a terminal DCF growth rate for his multi-stage growth DCF analysis,

3   Mr. Hevert has also totally ignored the well-known long-term real GDP growth

4   rate forecasts of the CBO and EIA and relied solely on historic data going back to

5   1929. Simply put, he is inconsistent in his methodology.

6

7   **B.   CAPM Approach**

8

9   **Q. Please discuss Mr. Hevert's CAPM.**

10   A. On pages 36-40 of his testimony and in Attachments RBH-5 - RBH-7, Mr. Hevert

11   estimates an equity cost rate by applying a CAPM model to his proxy group. The

12   CAPM approach requires an estimate of the risk-free interest rate, beta, and the

13   equity risk premium. Mr. Hevert uses two different measures of the 30-Year

14   Treasury bond yield (a) current yield of 3.06% and a near-term projected yield of

15   3.52%; (b) two different Betas (an average Bloomberg Beta of 0.646 and an

16   average *Value Line* Beta of 0.729), and (c) two market risk premium measures -

17   a Bloomberg, DCF-derived market risk premium of 10.28% and *Value Line*

18   derived market risk premium of 11.05%. Based on these figures, he finds a

19   CAPM equity cost rate range from 9.70% to 11.56%. Mr. Hevert's CAPM results

20   are summarized in Panel B of page 1 of Exhibit JRW-13.

21

22   **Q. What are the errors in Mr. Hevert's CAPM analysis?**

23   A. The two issues are: (1) the near-term projected 30-Year Treasury yield of 3.52%;

1   and (2) Mr. Hevert's CAPM analysis are the expected market risk premiums of

2   10.28% and 11.05%.

3

4   1.   Projected Risk-Free Interest Rates

5

6 **Q. What is the issue with the projected long-term Treasury rate of 3.52%?**

7 A. The 3.52% near-term projected yield is more than 50 basis points above current 30-

8   year Treasury rates.   Thirty-year Treasury bonds are currently yielding about

9   2.90%.   Institutional investors would not be buying bonds at this yield if they

10   expected interest rates to increase so much in the near-term. An increase of yields

11   of more than 50 basis points on 30-year Treasury bonds in near-term would result

12   in significant capital losses for investors buying bonds today at current market

13   yields.

14

15   2.   Market Risk Premiums

16

17 **Q. What are the errors in Mr. Hevert's CAPM analyses?**

18 A. The primary errors in Mr. Hevert's CAPM analyses are the market premiums of

19   10.28% and 11.05% which are based on the upwardly-biased long-term EPS

20   growth rate estimates of Wall Street analysts.

21

22 **Q. Please assess Mr. Hevert's market risk premiums derived from applying the**

23   **DCF model to the S&P 500 and *Value Line Investment Survey*.**

1   A. For his Bloomberg and *Value Line* market risk premiums, Mr. Hevert computes

2   market risk premiums of 10.28% and 11.05% by: (1) calculating an expected

3   market return by applying the DCF model to the S&P 500; and, then (2)

4   subtracting the current 30-year Treasury bond yield from the calculation. Mr.

5   Hevert's estimated expected market returns from these are 13.34% (using

6   Bloomberg three- to five-year EPS growth rate estimates) and of 14.11% (using

7   *Value Line* three- to five-year EPS growth rate estimates). Mr. Hevert also uses

8   (1) a dividend yield of 1.95% and an expected DCF growth rate of 11.39% for

9   Bloomberg and (2) a dividend yield of 1.90% and an expected DCF growth rate

10   of 12.21% for *Value Line.* These results are not realistic in today's market.

11

12   **Q. How did Mr. Hevert err when analyzing market premiums?**

13   A. The primary error is that Mr. Hevert computed the expected market return using

14   the DCF model with the growth rate being the projected 5-year EPS growth rate

15   from Wall Street analysts. As explained below, this produces an overstated

16   expected market return and equity risk premium.

17

18   **Q. What evidence can you provide that Mr. Hevert's growth rates are**

19   **erroneous?**

20   A. Mr. Hevert's expected long-term EPS growth rates of 11.39% for Bloomberg

21   and 12.21% for *Value Line* represent the forecasted 5-year EPS growth rates of

22   Wall Street analysts. The error with this approach is that the EPS growth rate

23   forecasts of Wall Street securities analysts are overly optimistic and upwardly

1   biased, and are inconsistent with the historic and projected growth in earnings

2   and the economy for three reasons: (1) long-term growth in EPS is far below Mr.

3   Hevert's projected EPS growth rates; (2) more recent trends in GDP growth, as

4   well as projections of GDP growth, suggest slower long-term economic and

5   earnings growth in the future; and (3) over time, EPS growth tends to lag behind

6   GDP growth.

7   The long-term economic, earnings, and dividend growth rate in the U.S. has

8   only been in the 5% to 7% range over the past 50 plus years. I performed a study

9   of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500

10   EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit

11   JRW-14, and a summary is provided in Table 5 below.

12   **Table 5**
13   **GDP, S&P 500 Stock Price, EPS, and DPS Growth**
14   **1960-Present**

Nominal GDP	6.51%
S&P 500 Stock Price	6.74%
S&P 500 EPS	6.56%
S&P 500 DPS	5.74%
Average	6.39%

15
16   The results are presented graphically on page 6 of Exhibit JRW-14. In sum,

17   the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the

18   5% to 7% range.

19

20   **Q. Do more recent data suggest that U.S. economic growth is faster or slower**

21   **than the long-term data?**

58

1   A. As previously discussed and presented in Table 4, the more recent trend suggests

2   lower future economic growth than the long-term historic GDP growth. The

3   historic GDP growth rates for 10-, 20-, 30-, 40- and 50- years clearly suggest that

4   nominal GDP growth in recent decades has slowed to the 4.0% to 5.0% area. By

5   comparison, Mr. Hevert's long-run growth rate projections of 11.39% and

6   12.21% are vastly overstated. These estimates suggest that companies in the U.S.

7   would be expected to: (1) increase their growth rate of EPS by almost 100% in

8   the future and (2) maintain that growth indefinitely in an economy that is

9   expected to grow at about one-half of his projected growth rates.

10

11   **Q.** **What level of GDP growth is forecasted by economists and various**

12   **government agencies?**

13   A. As previously discussed, there are several forecasts of annual GDP growth that are

14   available from economists and government agencies. These are listed in page 5 of

15   Exhibit JRW-14. These forecasts suggest long-term GDP growth rate in the 4.0%

16   to 4.7% range.

17

18   **Q.** **Why is GDP growth relevant in your discussion of Mr. Hevert's use of the**

19   **long-term EPS growth rates in developing a market risk premium for his**

20   **CAPM?**

21   A. Because, as indicated in recent research, the long-term earnings growth rates of

22   companies are on average limited to the growth rate in GDP. Brad Cornell of the

23   California Institute of Technology recently published a study on GDP growth,

1	earnings growth, and equity returns. He finds that long-term EPS growth in the
2	U.S. is directly related to GDP growth, with GDP growth providing an upward
3	limit on EPS growth. In addition, he finds that long-term stock returns are
4	determined by long-term earnings growth. He concludes with the following
5	observations:[38]

6	The long-run performance of equity investments is fundamentally
7	linked to growth in earnings. Earnings growth, in turn, depends on
8	growth in real GDP. This article demonstrates that both theoretical
9	research and empirical research in development economics suggest
10	relatively strict limits on future growth. In particular, real GDP
11	growth in excess of 3 percent in the long run is highly unlikely in the
12	developed world. In light of ongoing dilution in earnings per share,
13	this finding implies that investors should anticipate real returns on
14	U.S. common stocks to average no more than about 4–5 percent in
15	real terms.
16	

17	Given current inflation in the 2% to 3% range and real returns in the 4% to
18	5% range, the results imply nominal expected stock market returns in the 6% to
19	8% range. As such, Mr. Hevert's projected earnings growth rates and implied
20	expected stock market returns and equity risk premiums are not indicative of the
21	realities of the U.S. economy and stock market. As such, his expected CAPM
22	equity cost rate is significantly overstated.

| 23 | |

| 24 | **Q. Please provide a summary assessment of Mr. Hevert's projected equity risk** |
| 25 | **premium derived from expected market returns.** |

| 26 | A. Mr. Hevert's market risk premium derived from his DCF application to the S&P |
| 27 | 500 is inflated due to errors and bias in his study. Investment banks, consulting |

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[38] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January-February, 2010), p. 63.

1	firms, and CFOs use the equity risk premium concept every day in making
2	financing, investment, and valuation decisions. On this issue, the opinions of CFOs
3	and financial forecasters are especially relevant. CFOs deal with capital markets
4	on an ongoing basis since they must continually assess and evaluate capital costs
5	for their companies. They are well aware of the historical stock and bond return
6	studies of Ibbotson. The CFOs in the September 2017 *CFO Magazine* – Duke
7	University Survey of about 300 CFOs shows an expected return on the S&P 500
8	of 6.50% over the next ten years. In addition, the financial forecasters in the
9	February 2017 Federal Reserve Bank of Philadelphia survey expect an annual
10	nominal market return of 5.60% over the next ten years. As such, with a more
11	realistic equity or market risk premium, the appropriate equity cost rate for a
12	public utility should be in the 8.0% to 9.0% range and not in the 10.0% to 11.0%
13	range.

14   **C.**   **Bond Yield Risk Premium Approach**

15	
16	**Q. Please review Mr. Hevert's BYRP analysis.**
17	A. On pages 40-43 of his testimony and in Attachment RBH-8, Mr. Hevert estimates
18	an equity cost rate using a RP model. Mr. Hevert develops an equity cost rate by:
19	(1) regressing the authorized returns on equity for gas distribution companies from
20	the January 1, 1980 to March 31, 2017 time period on the thirty-year Treasury
21	Yield; and (2) adding the appropriate risk premium established in step (1) to three
22	different thirty-year Treasury yields: (a) current yield of 3.06% and a near-term
23	projected yield of 3.52%, and a long-term projected yield of 4.35%. Mr.

1   Hevert's RP results are provided in Panel C of page 1 of Exhibit JRW-13.   He

2   reports RP equity cost rates ranging from 9.94% to 10.25%.

3

4   **Q. What are the errors in Mr. Hevert's RP analysis?**

5   A. The two issues are: (1) the near-term and long-term projected 30-Year Treasury

6   yields of 3.52% and 4.35; and (2) primarily, the excessive risk premium.

7

8   1.   Projected Risk-Free Interest Rates

9

10   **Q. What are the issues with the projected long-term Treasury rates of 3.52% and**

11   **4.35%?**

12   A. The 3.52% and 4.35% projected yields are more than 50 and 150 basis points above

13   current 30-year Treasury rates. These figures are simply not reasonable.   Thirty-

14   year Treasury bonds are currently yielding about 2.90%.   Institutional investors

15   would not be buying bonds at this yield if they expected interest rates to increase so

16   dramatically in the coming years. An increase of yields of more than 50 and 150

17   basis points on 30-year Treasury bonds in the next couple years would result in

18   significant capital losses for investors buying bonds today at current market yields.

19

20   2   Risk Premium

21

22   **Q. What are the issues with Mr. Hevert's risk premium?**

23   A. There are several problems with this approach.   The methodology produces an

1	inflated measure of the risk premium because the approach uses historic authorized
2	ROEs and Treasury yields, and the resulting risk premium is applied to projected
3	Treasury Yields. Treasury yields are always forecasted to increase. The resulting
4	risk premium would be smaller if done correctly, that is, using projected Treasury
5	yields in the analysis rather than historic Treasury yields.
6 .	In addition, Mr. Hevert's RP approach is a gauge of *commission* behavior and
7	not *investor* behavior. Capital costs are determined in the market place through
8	the financial decisions of investors and are reflected in such fundamental factors
9	as dividend yields, expected growth rates, interest rates, and investors'
10	assessment of the risk and expected return of different investments. Regulatory
11	commissions evaluate capital market data in setting authorized ROEs, but also
12	take into account other utility- and rate case-specific information in setting
13	ROEs. As such, Mr. Hevert's approach and results reflect other factors such as
14	capital structure, credit ratings and other risk measures, service territory, capital
15	expenditures, energy supply issues, rate design, investment and expense trackers,
16	and other factors used by utility commissions in determining an appropriate ROE
17	in addition to capital costs. This may especially true when the authorized ROE
18	data includes the results of rate cases that are settled and not fully litigated.
19	Finally, Mr. Hevert's methodology produces an inflated required rate of
20	return since utilities have been selling at market-to-book ratios in excess of 1.0
21	for many years. This indicates that the authorized rates of return have been
22	greater than the return that investors require. The relationship between ROE,
23	the equity cost rate, and market-to-book ratios was explained earlier in this

1   testimony. In short, a market-to-book ratio above 1.0 indicates a company's

2   ROE is above its equity cost rate. Therefore, the risk premium produced from

3   the study is overstated as a measure of investor return requirements and produced

4   an inflated equity cost rate.

5

6   **D. Decoupling, Flotation Cost and Size Adjustments**

7

8   **Q. Please discuss Mr. Hevert's assessment of the Company's proposed decoupling**

9   **mechanism.**

10   A. Between pages 45-50 of his testimony and in Attachment RBH-11, Mr. Hevert

11   argues that the Company's proposed decoupling mechanism would not

12   materially reduce the risk of EnergyNorth relative to the proxy group because

13   revenue stabilization and cost recovery mechanisms are common among the

14   proxy companies. Therefore, in his opinion, the stock prices of the proxy

15   companies reflect the risk reduction associated with decoupling. In Attachment

16   RBH-11, he lists the subsidiary utilities of the proxy companies and lists the

17   adjustment clauses and alternative regulation plans associated with each.

18

19   **Q. Do you agree with Mr. Hevert's assessment of the risk impact of the**

20   **Company's proposed decoupling mechanism?**

21   A. No, for three reasons.

22   First, the stock prices of the proxy companies reflect the investment risks of

23   the entire proxy companies. As shown in Table 6, the companies in Mr. Hevert's

1   proxy group only receive 62% of their revenues from regulated gas operations.

2   As a result, a significant percent of the revenues of these companies are not even

3   regulated and therefore are clearly not associated with decoupling mechanisms.

4
5
6
7   **Table 6**
8   **Hevert Proxy Group**
9   **Percent of Regulated Gas Revenue**

Company	Percent Gas Revenue
Atmos Energy Corporation (NYSE-ATO)	**95**
Chesapeake Utilities Corporation (NYSE-CPK)	**17**
New Jersey Resources Corp. (NYSE-NJR)	**31**
Northwest Natural Gas Co. (NYSE-NWN)	**100**
South Jersey Industries, Inc. (NYSE-SJI)	**44**
Southwest Gas Corporation (NYSE-SWX)	**54**
Spire (NYSE-SR)	**95**
Mean	**62**

10   Date Source: 2016 SEC 10-K reports.

11   Second, a review of Attachment RBH-11 shows that only three proxy

12   companies have full decoupling (NJR, SJI, and SWX) and CPK has no

13   decoupling.   Therefore, even the regulated revenues for most of the proxy

14   companies do not have full decoupling.

15   Third, to provide an overall assessment of the potential impact decoupling on

16   EnergyNorth relative to the proxy companies, Mr. Hevert was asked the

17   following two questions.

18   Staff 4-18   With reference to pages 45-50, please provide: (1) the percent of
19   EnergyNorth's gas customers covered by the proposed decoupling
20   mechanism; (2) the percent of EnergyNorth's total revenues covered
21   by the proposed decoupling mechanism; (3) the percent of
22   EnergyNorth's gas volumes covered by the proposed decoupling

65

1		mechanism; and (4) copies of the underlying data, work papers, and
2		source documents used in (1), (2), and (3) in both paper and
3		electronic (Microsoft Excel Worksheet) forms.
4		
5	Staff 4-19	With reference to page 47 and Attachment RBH-11, for each of the
6		companies in the proxy group, please provide: (1) the percent of total
7		gas customers covered by each of the proposed decoupling
8		mechanisms; (2) the percent of total company revenues covered by
9		each of the proposed decoupling mechanisms; (3) the percent of total
10		company gas volumes covered by each of the proposed decoupling
11		mechanisms; and (4) copies of the underlying data, work papers, and
12		source documents used in (1), (2), and (3) in both paper and
13		electronic (Microsoft Excel Worksheet) forms.
14		

15   Mr. Hevert's response to both questions was that he had not performed the

16   requested analyses. He noted that determining customers, revenues, and volumes

17   impacted by decoupling would "require complex analyses relying on multiple

18   assumptions."

19

20   **Q. Please summarize your assessment of Mr. Hevert's discussion on the risk**

21   **impact of the Company's proposed decoupling mechanism.**

22   A. I find that Mr. Hevert's assessment of the risk impact of the Company's

23   proposed decoupling mechanism relative to the proxy group is erroneous. As I

24   highlight above: (1) the proxy companies have a significant percentage of

25   unregulated revenue that is not decoupled; (2) Only three of the seven proxy

26   companies have full decoupling, and one has no decoupling; and (3) Mr. Hevert

27   has not provided an analysis that compares the percent of decoupled customers,

28   revenues, and gas volumes for EnergyNorth and the proxy gas companies.

29   Therefore, based on these observations, Mr. Hevert cannot come to the

1   conclusion that the Company's proposed decoupling mechanism does not

2   materially impact its risk relative to the proxy companies.

3

4   **Q. Please discuss Mr. Hevert's adjustment for flotation costs.**

5   A. Mr. Hevert claims than an equity cost rate recommendation of 0.11% is justified

6   to account for flotation costs. However, he has not identified any flotation costs

7   for EnergyNorth. Therefore, he is claiming that the Company deserves additional

8   revenues in the form of a high ROE to account for flotation costs that have not

9   been identified.

10   Beyond this issue, it is commonly argued that a flotation cost adjustment

11   (such as that used by the Company) is necessary to prevent the dilution of the

12   existing shareholders. However, this is incorrect for several reasons:

13   (1)   If an equity flotation cost adjustment is similar to a debt flotation cost

14   adjustment, the fact that the market-to-book ratios for gas distribution companies

15   are over 1.5X actually suggests that there should be a flotation cost *reduction*

16   (and not an increase) to the equity cost rate. This is because when (a) a bond is

17   issued at a price in excess of face or book value, and (b) the difference between

18   its market price and the book value is greater than the flotation or issuance costs,

19   the cost of that debt is lower than the coupon rate of the debt. The amount by

20   which market values of gas distribution companies are in excess of book values

21   is much greater than flotation costs. Hence, if common stock flotation costs

22   were exactly like bond flotation costs, and one was making an explicit flotation

67

1 cost adjustment to the cost of common equity, the adjustment would be

2 downward;

3   (2) If a flotation cost adjustment is needed to prevent dilution of existing

4 stockholders' investment, then the reduction of the book value of stockholder

5 investment associated with flotation costs can occur only when a company's

6 stock is selling at a market price at or below its book value. As noted above, gas

7 distribution companies are selling at market prices well in excess of book value.

8 Hence, when new shares are sold, existing shareholders realize an increase in

9 the book value per share of their investment, not a decrease;

10   (3) Flotation costs consist primarily of the underwriting spread (or fee)

11 rather than out-of-pocket expenses. On a per-share basis, the underwriting

12 spread is the difference between the price the investment banker receives from

13 investors and the price the investment banker pays to the company. , These are

14 not expenses that should be recovered through the regulatory process.

15 Furthermore, the underwriting spread is known to the investors who are buying

16 the new issue of stock, and who are well aware of the difference between the

17 price they are paying to buy the stock and the price that the company is

18 receiving. The offering price which they pay is what matters when investors

19 decide to buy a stock based on its expected return and risk prospects. Therefore,

20 the Company is not entitled to an adjustment to the allowed return to account for

21 those costs; and

22   (4) Flotation costs, in the form of the underwriting spread, are a form of a

23 transaction cost in the market. They represent the difference between the price

1   paid by investors and the amount received by the issuing company. Whereas

2   EnergyNorth believes that it should be compensated for these transaction costs, it

3   has not accounted for *other* market transaction costs in determining its cost of

4   equity. Most notably, brokerage fees that investors pay when they buy shares in

5   the open market are another market transaction cost. Brokerage fees increase the

6   effective stock price paid by investors to buy shares. If the Company had

7   included these brokerage fees or transaction costs in its DCF analysis, the higher

8   effective stock prices paid for stocks would lead to lower dividend yields and

9   equity cost rates. This would result in a downward adjustment to their DCF

10 equity cost rate.

11 Finally, I would point out that the New Hampshire PUC has found that, lacking

12 any evidence of actual or planned issuances, such costs should not be

13 compensated." *See* Re: Pennichuck Water Works, Inc. 70 NH PUC 850, 863

14 (1985, 70 NH PUC 862).

15

16 **Q. What other adjustments does Mr. Hevert propose?**

17 A. In his assessment of the Company's business risk, Mr. Hevert claims that

18   EnergyNorth deserves a small size premium.

19

20 **Q. Do you agree with Mr. Hevert's claim that the company deserves a small**

21   **size premium?**

22 A. No. The inclusion of a size premium is erroneous for two reasons.

1   First, I have used the credit ratings of EnergyNorth and the companies in the

2   proxy group for risk comparison purposes. In their assessment of business risk,

3   credit rating agencies include various factors including the size and geographic

4   service territory of a utility. Therefore, there is no reason to make a separate

5   adjustment for size.

6   Second, Mr. Hevert justifies his size adjustment based on the historical stock

7   market returns studies as performed by Morningstar (formerly Ibbotson

8   Associates). There are numerous errors in using historical market returns to

9   compute risk premiums.[39] These errors provide inflated estimates of expected

10   risk premiums. Among the errors are survivorship bias (only successful

11   companies survive – poor companies do not) and unattainable return bias (the

12   Ibbotson procedure presumes monthly portfolio rebalancing). The net result is

13   that Ibbotson's size premiums are poor measures for risk adjustment to account

14   for the size of a utility.

15   In addition, Professor Annie Wong has tested for a size premium in utilities

16   and concluded that, unlike industrial stocks, utility stocks do not exhibit a

17   significant size premium.[40] As explained by Professor Wong, there are several

18   reasons why such a size premium would not be attributable to utilities. Utilities are

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[39] These issues are addressed in a number of studies, including: Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2015 Edition" NYU Working Paper, 2015, pp. 32-5; See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983); Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002); Bradford Cornell, *The Equity Risk Premium* (New York, John Wiley & Sons),1999, pp. 36-78; J. P. Morgan, "The Most Important Number in Finance," p. 6., Duff & Phelps, Client Alert, March 16, 2016, p. 35.
[40] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," *Journal of the Midwest Finance Association*, pp. 95-101, (1993).

1   regulated closely by state and federal agencies and commissions, and hence, their

2   financial performance is monitored on an ongoing basis by both the state and

3   federal governments.   In addition, public utilities must gain approval from

4   government entities for common financial transactions such as the sale of securities.

5   Furthermore, unlike their industrial counterparts, accounting standards and

6   reporting are fairly standardized for public utilities.   Finally, a utility's earnings are

7   predetermined to a certain degree through the ratemaking process in which

8   performance is reviewed by state commissions and other interested parties.

9   Overall, in terms of regulation, government oversight, performance review,

10   accounting standards, and information disclosure, utilities are much different than

11   industrials, which could account for the lack of a size premium.

12

13   **Q. Please discuss the research on the size premium in estimating the equity**

14   **cost rate.**

15   A. As noted, there are errors in using historical market returns to compute risk

16   premiums. With respect to the small firm premium, Richard Roll (1983) found

17   that one-half of the historic return premium for small companies disappears once

18   biases are eliminated and historic returns are properly computed.   The error

19   arises from the assumption of monthly portfolio rebalancing and the serial

20   correlation in historic small firm returns.[41]

21   In another paper, Ching-Chih Lu (2009) estimated the size premium over the

22   long-run.   Lu acknowledges that many studies have demonstrated that smaller

---

[41] *See* Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983).

71

1   companies have historically earned higher stock market returns. However, Lu

2   highlights that these studies rebalance the size portfolios on an annual basis.

3   This means that at the end of each year the stocks are sorted based on size, split

4   into deciles, and the returns are computed over the next year for each stock

5   decile. This annual rebalancing creates the problem. Using a size premium in

6   estimating a CAPM equity cost rate requires that a firm carry the extra size

7   premium in its discount factor for an extended period of time, not just for one

8   year, which is the presumption with annual rebalancing. Through an analysis of

9   small firm stock returns for longer time periods (and without annual

10   rebalancing), Lu finds that the size premium disappears within two years. Lu's

11   conclusion with respect to the size premium is that "a small firm should not be

12   expected to have a higher size premium going forward sheerly because it is small

13   now":[42]

14   However, an analysis of the evolution of the size premium will show
15   that it is inappropriate to attach a fixed amount of premium to the
16   cost of equity of a firm simply because of its current market
17   capitalization. For a small stock portfolio which does not rebalance
18   since the day it was constructed, its annual return and the size
19   premium are all declining over years instead of staying at a relatively
20   stable level. This confirms that a small firm should not be expected
21   to have a higher size premium going forward sheerly because it is
22   small now.
23
24   Finally, in a more recent paper, Ang (2017) tested for a size effect over the

25   time period 1981-2016.[43] He used value-weighted size-based decile returns

26   obtained from French's Data Library, with the smallest size-based decile as a

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[42] Ching-Chih Lu, "The Size Premium in the Long Run," 2009 Working Paper, SSRN abstract no. 1368705.

[43] Clifford Ang, "The Absence of a Size Effect Relevant to the Cost of Equity," June 9, 2017, available at https://ssrn.com/abstract=2984599.

1   proxy for small stocks and the largest size-based decile as a proxy for large

2   stocks. He found that small stocks underperformed large stocks by 12% over the

3   period 1981 to 2016. He claims that this result is consistent with other studies

4   that the size effect vanished in the 1980s. He concluded with the following:[44]

5

6   My review of the evidence and analysis strongly suggests the
7   proponents of the size effect are nowhere close to meeting their
8   burden. I find that investors use the CAPM and do not demand
9   compensation for size when setting their required rate of return,
10   which directly contradicts the need to augment or modify the
11   CAPM Cost of Equity with a size premium. I show that small
12   stocks do not outperform large stocks, which calls into question the
13   very premise of a size effect. I also find that studies finding a size
14   effect suffer from the twin fatal flaws of lacking a theoretical basis
15   and data mining, which are very difficult, if not impossible, to
16   overcome. Given the above, practitioners should abandon the
17   practice of augmenting or modifying the CAPM Cost of Equity
18   with a size premium.
19

20   **Q. Does this conclude your testimony?**

21   A. Yes, it does.

22

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[44] *Ibid.*, p. 6.